

# Interoperability Pilot

August 10, 2006

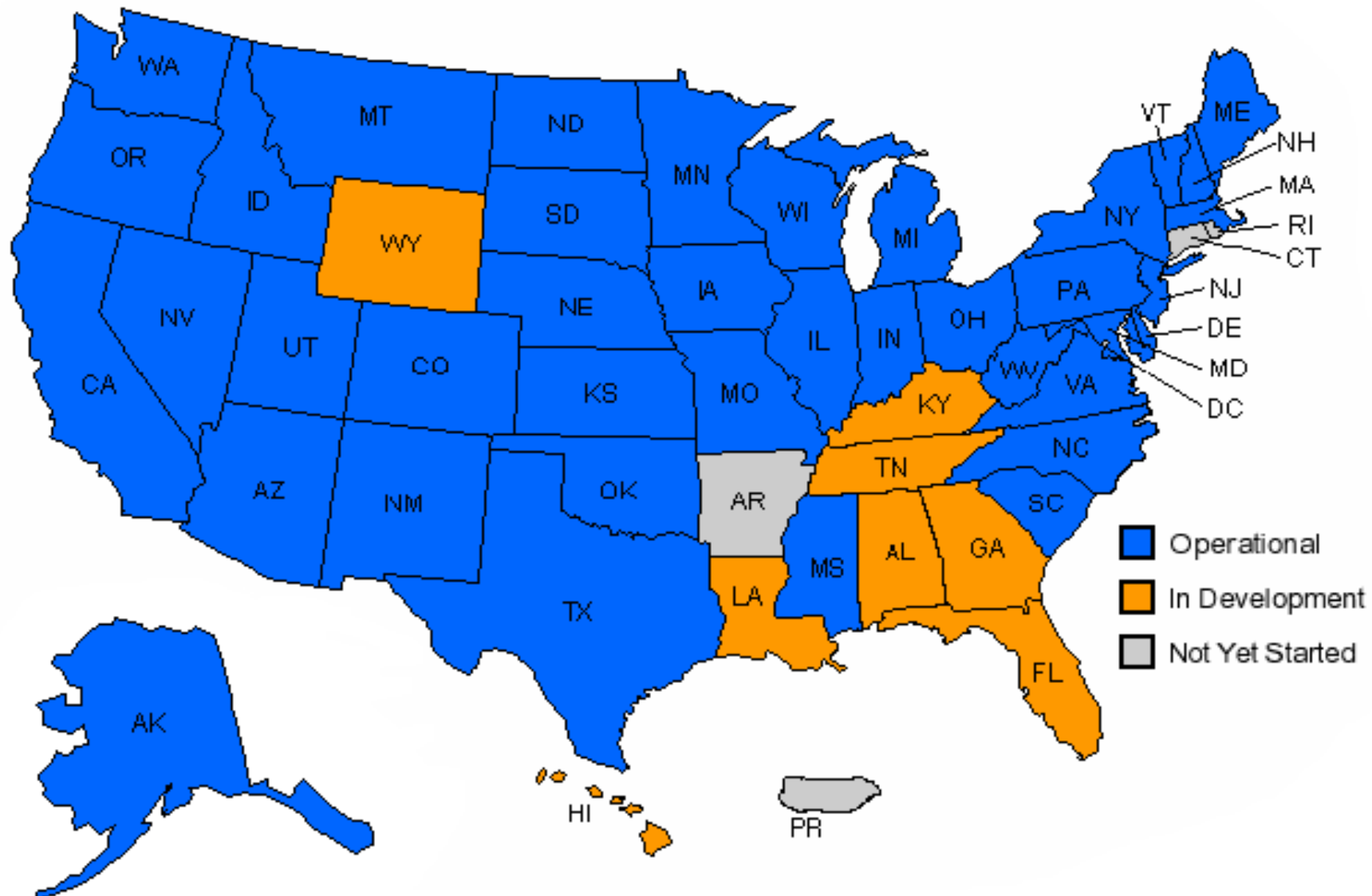
# Topics

- Exchange Network History
- Deployment Status
- Service Oriented Architecture
- Pilot Project Description
- Available Tools
- Network Horizon



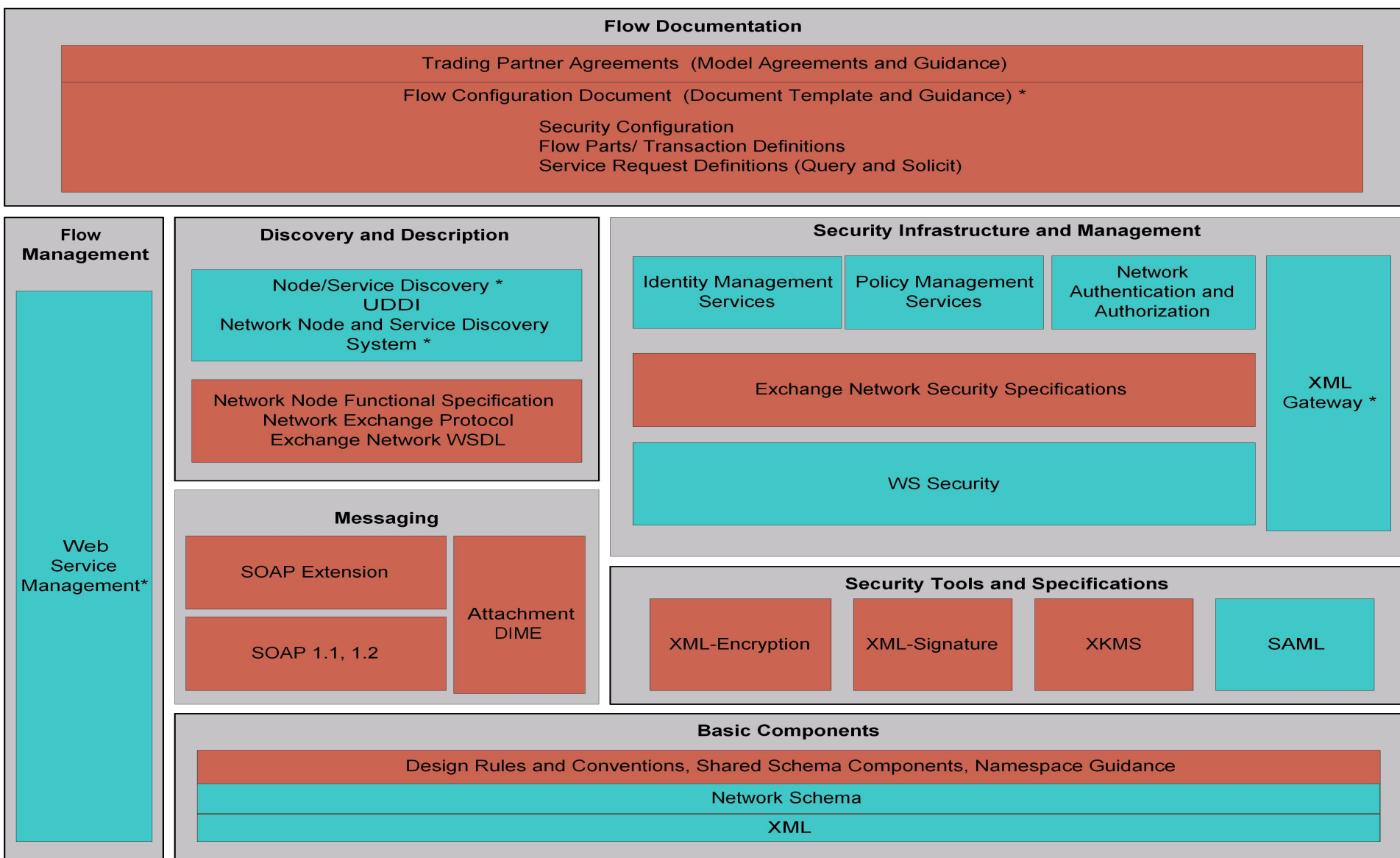
# **Exchange Network Background**

# Exchange Network Status



# Network / CDX Exchanges

- Air Quality System
- E-Beaches
- E-Discharge Monitoring Report
- E-Grants
- Facility Registry System
- National Emissions Inventory
- Resource Conservation and Recovery Act
- Safe Drinking Water
- Substance Registry System
- Toxic Release Inventory
- Water Quality Monitoring



# Exchange Network Interoperability Standards and Specifications

# FHA Interoperability Workgroup

## Processes

Discovery, Aggregation, Choreography...

## Descriptions

Web Services Descriptions (WSDL)

## Messages

### SOAP Extensions

Reliability, Correlation, Transactions ....

### SOAP

## Communications

HTTP, SMTP, FTP, JMS, IIOP, ....

Base Technologies: XML, DTD, Schema

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SECURITY

MANAGEMENT

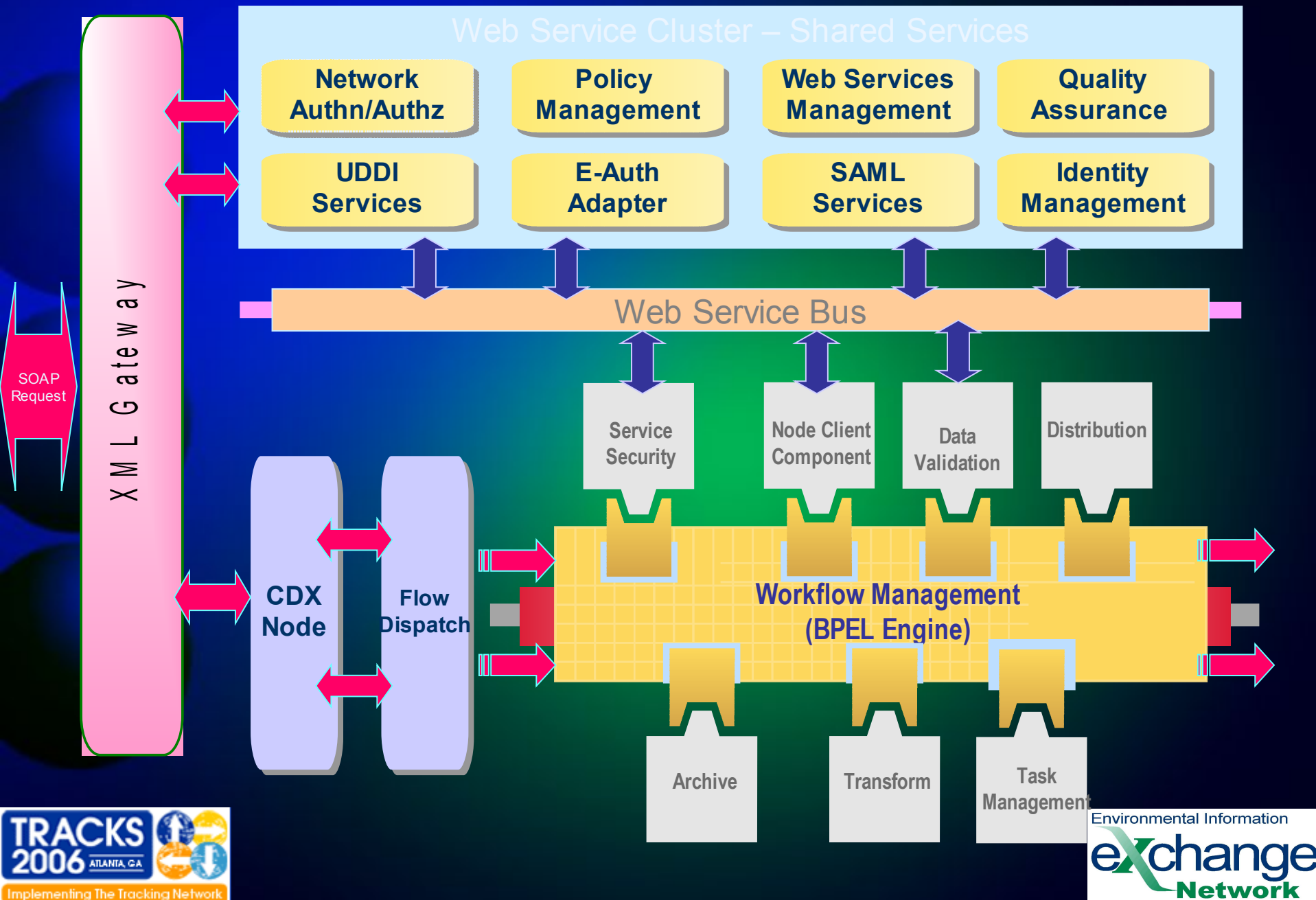


# Network Goals

- Long Term Expansion of Information Sharing
- Simplify Integration / Provide Components
- Build an Integration Model with Clear Advantages
- Sustainability - Partners Internalize the Architecture
- Interoperability at all levels (Fed, State, Tribe, Industry, Public, International, Interstellar)
- Service and Component Based Architecture
  - Reusable Components
  - Shared Services



# CDX Shared Services / SOA Model



The background features a 3x6 grid of spheres. The spheres on the left are blue, and they transition to green towards the right. The text 'The Pilot' is centered on the left side of the grid.

# **The Pilot**

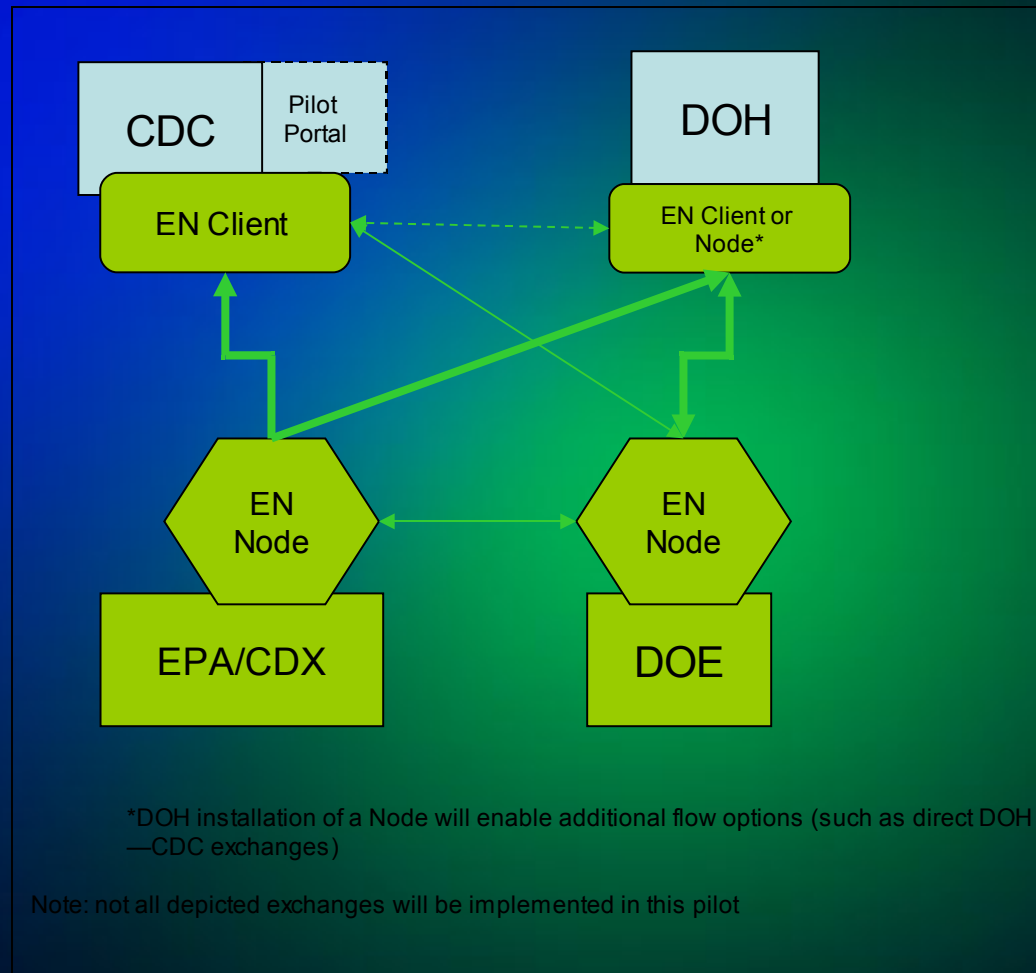
# Participants

- EPA
- CDC
- New York State
- New York City
- Washington State
- Colorado / Utah

# Interop Pilot

- The pilot will consist of the following:
  - **EPA** will make available, via its Node (CDX) on the Exchange Network, certain data (the current candidate is air monitoring data), which can be retrieved by partners.
  - **CDC** will access this EPA data, using an Exchange Network client application. Optionally, CDC will perform some transformation and/or analysis on this data and mount the results (and/or the data) on a prototype secured data access portal. This step is intended to demonstrate both CDC's successful retrieval of that data, and the ability (and synergy) of portals, and other applications to access network based environment and public health data services.
  - **State Departments of Health** are invited to participate via two options:
    - by installing an Exchange Network client application which would allow them to access the demonstration data sets from EPA and/or their DOE state partner; and, optionally, to securely send ("push") a demonstration data set to other partners, or
    - by installing/utilizing an existing Exchange Network Node to make a demonstration set of environmental public health data available for secured access by their state environmental agency partner (and potentially CDC).
  - **State Departments of Environment** are invited to participate by making available, via their Exchange Network Nodes, a demonstration data set of additional environmental data, and/or to securely retrieve/receive a demonstration data set from their state public health agency.
  - **Demonstration Data Set Candidates:** As far as possible, the pilot will exchange "real" data. Enhancements have been made to the Exchange Network client applications to include additional security measures, such as payload encryption. However, where security logistics, and/or other considerations preclude the use of actual health data for this pilot, "sample" data may be inserted into the standard xml schema to demonstrate all technical aspects of the exchange. Current candidate data sets (may be revised) are:
    - Air quality monitoring data
    - Aggregated asthma incidence
    - Drinking water laboratory analysis results
    - Others??

# Interrop Flows





# Objectives

- Demonstrate a secure, standards based, user friendly approach for information exchange
- Exchange air quality and asthma data
- EPA
  - Publish air quality data on the Exchange Network
  - Provide tools
    - Client application
    - Software Developer Kit (a web service integration tool).
  - Provide support
- CDC
  - Access Air and Asthma data,
  - Perform transformation and/or analysis
  - Mount the results on a portal
  - Demonstrate secured data access

# Mixed PHASE Schema?

```
<xs:element name="Age" type="xs:integer"></xs:element>
<xs:element name="DateBirth" type="xs:date"></xs:element>
<xs:element name="DateAdmission" type="xs:date" />
<xs:element name="DateDischarge" type="xs:date" />
<xs:element name="Ethnicity" type="xs:string" />
<xs:element name="PrimaryDiagnosisICD" type="xs:string" />
<xs:element name="InsuranceType" type="xs:string" />
<xs:element name="Race" type="xs:string" />
<xs:element name="ZIPCode" type="xs:string" />
<xs:element name="Gender" type="xs:string" />
<xs:element name="StdAgeRate" type="xs:decimal" />
<xs:element name="AnnualRate" type="xs:decimal" />
<xs:element name="AnnualHospitalized" type="xs:decimal" />
<xs:element name="DailyDischarge" type="xs:decimal"/>
<xs:element name="Ozone8HourAvg" type="xs:integer" />
<xs:element name="OzoneMonthAvg" type="xs:integer" />
<xs:element name="OzoneQuarterAvg" type="xs:integer" />
<xs:element name="OzoneSampleConcentration" type="xs:integer" />
<xs:element name="OzoneWarmAvg" type="xs:integer" />
<xs:element name="AnnualAvg" type="xs:decimal" />
<xs:element name="Daily24HourAvg" type="xs:decimal" />
```



# Tools

- Shared Services
- Test Tools
- Software Developer Kit
- Node Clients
- Multiple Node Implementations
- Open Source Node
- XML Mapping Engine
- Schema Form Generator

## Welcome to the Node Client!

This area displays up-to-date information about the latest features and enhancements to the Node Client 2006. In addition to feature updates, this area can be used to alert you to Exchange Network events such as availability of new services, Network service outages and other important information.

### Node Client Features Include:

**Query Wizard** makes getting data easy

Save your queries and rerun them anytime

**Quality Assurance Wizard** for validating XML documents

Schematron support for extended business rule validation

**Data Submission Wizard** for secure submission

XML Key Management System Integration

**History** function stores and manages query result data

Interactive mapping using data from your query (Google)

Style sheet and Data Grid support

Encryption and Signature support

Self-contained, updatable list of available nodes and services

Automatic updates inform you when a new version is available

Query sharing with any other user

Multi-Node simultaneous queries

**User Account:** superdadatron@gmail.com  
**Registered On:** 8/2/2006 11:45:06 AM  
**Last Access On:** 8/2/2006 11:45:06 AM  
**Last Access From:** 161.80.70.57  
**User Version:** 1.1.12  
**Current Version:** 1.0.11

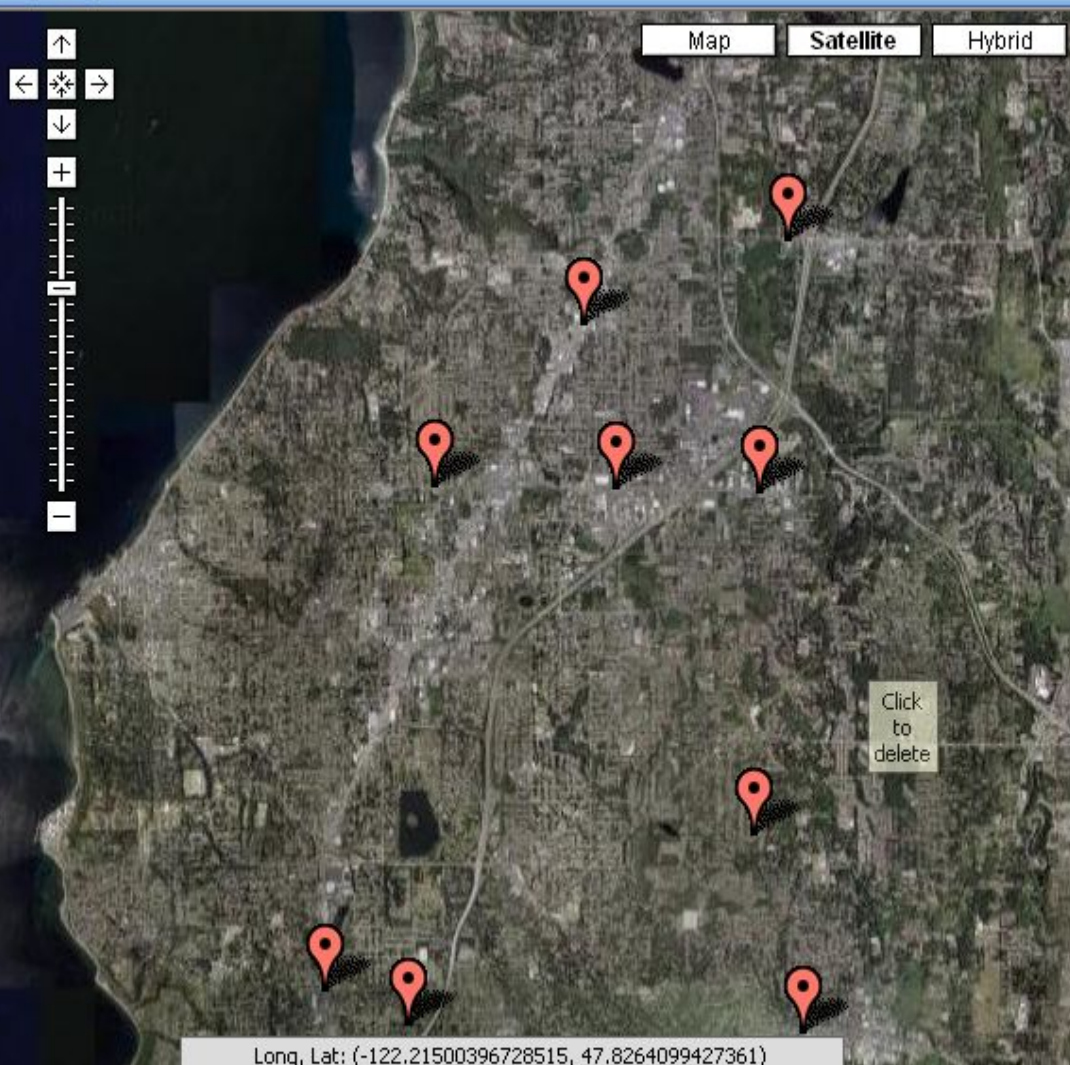
[Click here to update your client.](#)

[Download the latest DISCO file](#)

## Map



Close



Map

Satellite

Hybrid

Zoom:

Washington



## Help:

You can use right-click to zoom in on an area of the map.

Use left click to start selection and subsequent click to end selection.

## Status:

Selection ended

Click  
to  
delete

Long, Lat: (-122.21500396728515, 47.8264099427361)

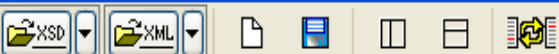
# Secure Node Client Software Developer Kit (SDK)

- Allows an application to integrate with the Exchange Network with just few lines of code
- XML Key Management System (XKMS)
- Supports XML Encryption and XML Signature.
  1. Sign Files
  2. Verify signatures
  3. Encrypt Files
  4. Decrypt File
- Discover / Query the Network

# Data Mapping Node Client

- Creates Data Entry Forms from Schema
- Maps data from any backend system to schema via configuration file
- Submits data via web service to other nodes





Edit XML document

☒ **asthmaRecord**

<input checked="" type="checkbox"/> <b>Age</b>	<input type="text" value="50"/>
<input checked="" type="checkbox"/> <b>DateBirth</b>	<input type="text" value="asfd"/>
<input checked="" type="checkbox"/> <b>DateAdmission</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>DateDischarge</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>Ethnicity</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>PrimaryDiagnosisICD</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>InsuranceType</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>Race</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>ZIPCode</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>Gender</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>StdAgeRate</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>AnnualRate</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>AnnualHospitalized</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>DailyDischarge</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>MonthlyHospitalized</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>CVDStdAgeRate</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>CVDAnnualRate</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>CVDAnnualHospitalized</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>CVDDailyDischarge</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>CVDMonthlyHospitalized</b>	<input type="text"/>
<input checked="" type="checkbox"/> <b>Ozone1HourMax</b>	<input type="text"/>

XML Form Generated Directly from schema

Form submitted to web service upon completion

Schema validation errors in real time as data is entered

NS=http://tempuri.org/XMLSchema.xsd

Error: cvc-datatype-valid.1.2.1: 'asfd' is not a valid value for 'date'  
http://www.w3.org/2001/XMLSchema,date

# Questions?

- References:
  - [www.epa.gov/webservices](http://www.epa.gov/webservices)
  - [www.epa.gov/cdx](http://www.epa.gov/cdx)
  - [www.exchangenetwork.net](http://www.exchangenetwork.net)
  - Contact William Sonntag,  
[Sonntag.William@epa.gov](mailto:Sonntag.William@epa.gov)